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NOTES ON GEOGRAPHIC DISTRIBUTION

Bivalvia, Mytilidae, *Limnoperna fortunei*: distribution extension

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The golden mussel (*Limnoperna fortunei*) is native from southern Asia and has become abundant elsewhere due to its rapid growth, early maturation, successful recruitment and paucity of natural predators. Its veliger larvae allows a quick dispersal through several mechanisms including water currents, animal and ship transport (ballast waters), and fishing activities (Morton 1977; Garcia and Protogino 2005). They had colonized a wide range of freshwater and estuarine environments. In urban areas, the golden mussel has a significant and noticeable impact on human activities by damaging dams and industries. The most significant problems are associated with pipe obstruction, reduction of pipe flow velocity because of turbulent flows, empty mollusc valve accumulation and waterway pollution from massive mortality, filter occlusion as well as increase in surface corrosion because of mussel infestation (Darrigran 2002).

The golden mussel was first introduced by ballast waters in South America in 1991 at La Plata River basin, Argentina (Pastorino et al. 1993; Darrigran and Pastorino 1995), and has since expanded its range to the Paraná, Paraguay, Pilcomayo, and Uruguay rivers in Argentina, Brazil, Paraguay and Uruguay (Boltovskoy and Cataldo 1999; Oliveira 2003; Brugnoli et al. 2005).

In 1998, the golden mussel was recorded at the northern reaches of the Patos Lagoon drainage basin (Mansur et al. 1999; 2003), and in the following years the species appeared in its southern portion (Mansur et al. 2003; Capítoli and Bemvenuti 2004). In 2005, *Limnoperna* was captured at São Gonçalo channel, which connects Patos and Mirim lagoons (Burns et al. in press). We report here the first occurrence of this species at Taim, a wetland ecological reserve located at southeastern portion of Mirim lagoon (Figure 1).

On 21st March 2006, eight individuals (ranging from 12 to 17 mm in total length) were collected by beach seine hauls at Nicola Lake, in the Taim Ecological Reserve. Comparing their size ranges with those reported on the literature (Magara et al. 2001), these individuals can be considered as adults. This species have not been found in previous beach seine sampling conducted monthly, since March 2004, at Nicola and others sites also in Taim reserve (e.g., Flores, Jacaré and Mangueira lakes) (Garcia et al. 2006). However, although they were not collected at the time, some individuals of golden mussel were observed by one of the authors (DMLMM) attached to emergent macrophytes during the summer of 2005.

Our current finding shows that the golden mussel seems to be spreading rapidly across Patos-Mirim Lagoon drainage basin (approx. 200,000 km^2). After only eight years since its first record on its northern region (Mansur et al. 1999), it is now captured at its southeastern portion (Figure 1). In their review of the distribution of the golden mussel at the main hydrographical basins of Uruguay, Brugnoli et al. (2005) affirmed that the golden mussel did not occur at the Mirim Lagoon. However, recent records of the golden mussel at the São Gonçalo channel (Burns et al. in press) and Taim Reserve (present work), located in the northern and southeastern portions of the Mirim lagoon, respectively, suggested this species could also occur in this lagoon.

Occurrence of this exotic species at Taim brings concern because this area constitutes a crucial ecological reserve protecting unique subtropical wetland in southern Brazil and harbors an exceptional biological diversity (Motta Marques

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et al. 2002). Previous studies (Magara et al. 2001; Mansur et al. 2003) have reported deleterious effects of golden mussel in natural environment and its native biota, such as destruction of habitats and impoverishment of epibenthic and infaunal native fauna.

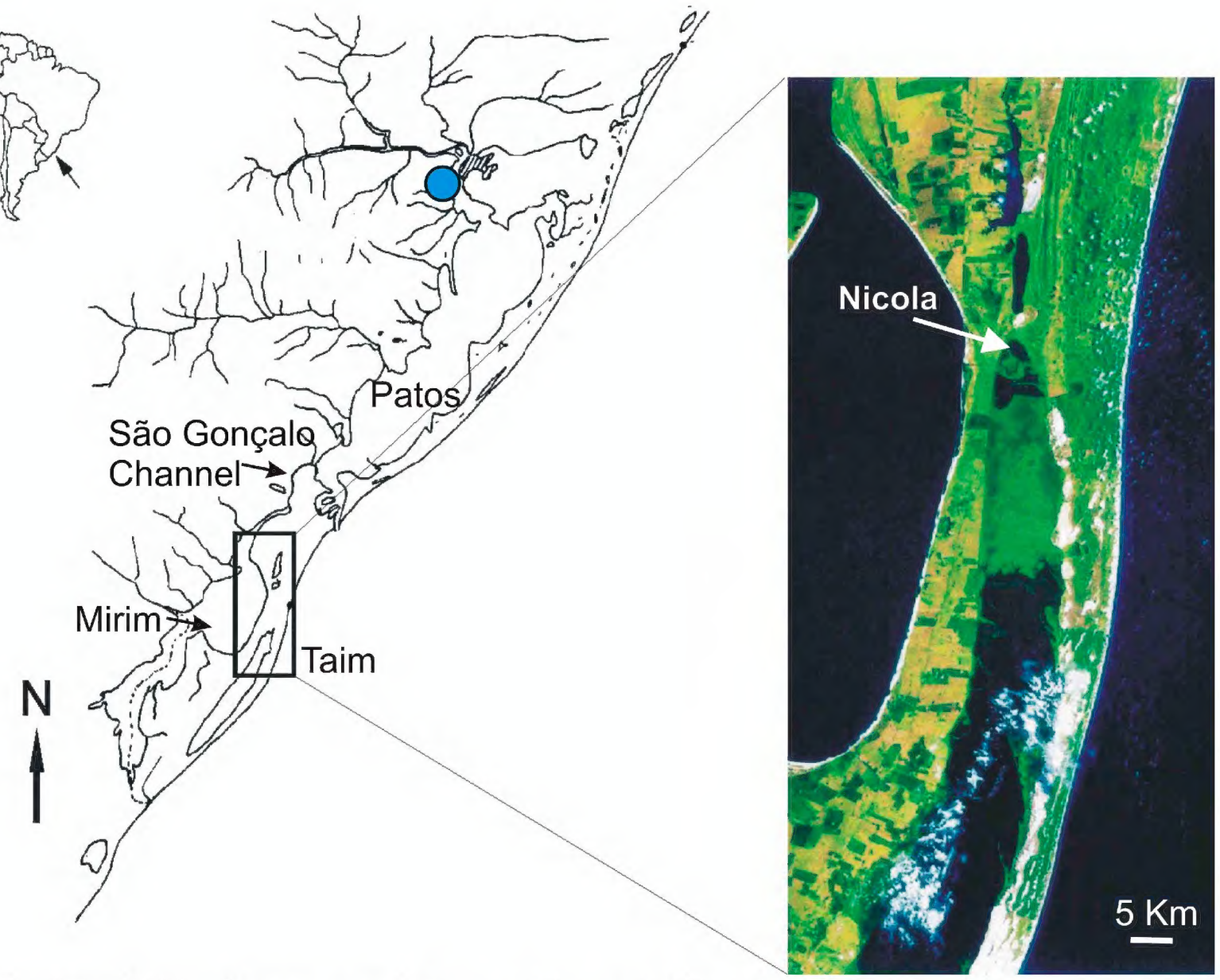

Figure 1. Patos-Mirim lagoon complex in southern Brazil and Taim Ecological Reserve (enlarged area) showing Nicola Lake, where individuals of the golden mussel *Limnoperma fortunei* were captured on March 2006. Blue dot denotes first record of this species in Patos Lagoon in 1998 according to Mansur et al. (1999).

Literature cited

Boltovskoy, D. and D. Cataldo. 1999. Population dynamics of *Limnoperna fortunei* an invasive fouling mollusk in the lower Paraná river (Argentina). Biofouling 14(3): 255-263.

Brugnoli, E., J. Clemente, L. Boccardi, A. Borthagaray and F. Scarabino. 2005. Golden mussel *Limnoperna fortunei* (Bivalvia: Mytilidae) distribution in the main hydrological basins of Uruguay: update and predictions. Anais da Academia Brasileira de Ciências 77(2): 235-244.

Burns, M. D. M., R. M. Geraldi, A. M. Garcia, C. E. Bemvenuti, R. Capitoli and J. P. Vieira. (in press). Primeiro Registro de Ocorrência do Mexilhão Dourado *Limnoperma fortunei* (Dunker, 1857) na Bacia de Drenagem da Lagoa Mirim, RS, Brasil. Biociências 4(1).

Capítoli, R. R. and C. E. Bemvenuti. 2004. Distribuição do mexilhão dourado *Limnoperna fortunei* (Dunker 1857) na área estuarina da Lagoa dos Patos e Canal São Gonçalo. Anais do VI Simpósio de Ecossistemas Brasileiros 1-8.

Darrigran, G. A. and G. Pastorino. 1995. The recent introduction of a freshwater Asiatic bivalve, *Limnoperna fortunei* (Mytilidae) into South America. The Veliger 38: 171-175.

Darrigran, G. A. 2002. Potential impact of filter-feeding invaders on temperate inland

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freshwater environments. Biological Invasions 4: 145-156.

García, M. L. and L. C. Protogino. 2005. Invasive freshwater mollusks are consumed by native fishes in South America. Journal of Applied Ichthyology 21: 34–38.

Garcia, A. M., M. A. Bemvenuti, J. P. Vieira, D. M. L. Motta Marques, M. D. M. Burns, A. Moresco and M. V. Condini. 2006. Checklist comparison and dominance patterns of the fish fauna at Taim Wetland, South Brazil. Neotropical Ichthyology 4(2): 261-268.

Magara, Y., Y. Matsui, Y. Gotto and A. Yuasa. 2001. Invasion of the non-indigenous nuisance mussel, *Limnoperna fortunei*, into water supply facilities in Japan. Journal of Water Supply: Research and Technology – AQUA (50)3: 113-124.

Mansur, M. C. D., L. M. Z. Richinitti and C. P. Dos Santos. 1999. *Limnoperna fortunei* (Dunker, 1857) molusco bivalve invasor na bacia do Guaíba, Rio Grande do Sul, Brasil. *Biociências* (7)2: 147-149.

Mansur, M. C. D., C. P. Dos Santos, G. Darrigran, I. Heydrich, C. T. Callil and F. R. Cardoso. 2003. Primeiros dados quali-quantitativos do mexilhão-dourado, *Limnoperna fortunei* (Dunker), no Delta do Jacuí, no Lago Guaíba e na Laguna dos Patos, Rio Grande do Sul, Brasil e alguns aspectos de sua invasão no novo ambiente. Revista Brasileira de Zoologia (20)1: 75-84.

Morton, B. 1977. The populations dynamics of *Limnoperna fortunei* (Dunker, 1857) (Bivalvia: Mytilacea) in Plover Cove reservoir, Hong Kong. Malacologia 16, 165-182.

Motta Marques, D. M. L., C. Tucci, C. Calazans, V. L. M. Callegaro and A. Villanueva. 2002. O Sistema Hidrológico do Taim - site 7. Pp. 125-144. In U. Seeliger, C.V. Cordazzo and F. Barbosa (eds.) Os Sites e o programa Brasileiro de pesquisas ecológicas de longa duração, Belo Horizonte. MCT-CNPq.

Oliveira, M. D. 2003. Ocorrência e impactos do Mexilhão dourado *Limnoperna fortunei* (Dunker, 1857) no Pantanal Mato-Grossense. EMBRAPA, Corumbá, MS: Circular Técnica 38: 6p.

Pastorino, G., G. Darrigran, S. Martín and L. Lunaschi. 1993. *Limnoperna fortunei* (Dunker, 1857) (Mytilidae), nuevo bivalvo invasor en aguas del río de la Plata. Neotrópica (39)34: 101-102.

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